PHOENIX TRAINING

LESSONS LEARNT

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Report Documentation Page

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AGENDA

- What is Phoenix
- Changes to Phoenix Operational Requirements
- What were the Training Requirements
- The Training Split - Why and How
- Maintenance Training - How did we do it
- Maintenance Training - What has Changed
- Maintenance Training - Lessons Learnt
- Operator Training - How was it carried out
- Operator Training - What has Changed
- Operator Training - Lessons Learnt
- Summary

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PHOENIX

- Army's first fully-equipped pilotless aircraft system for real time remote targeting and battlefield surveillance.
- Originally designed to provide surveillance and target acquisition for the Multiple Launch Rocket System and the AS90 SP gun.
- BAE SYSTEMS was awarded the £80 million fixed price contract in February 1985 as prime contractor.
- Flight Refueling Ltd. is our principal subcontractor.

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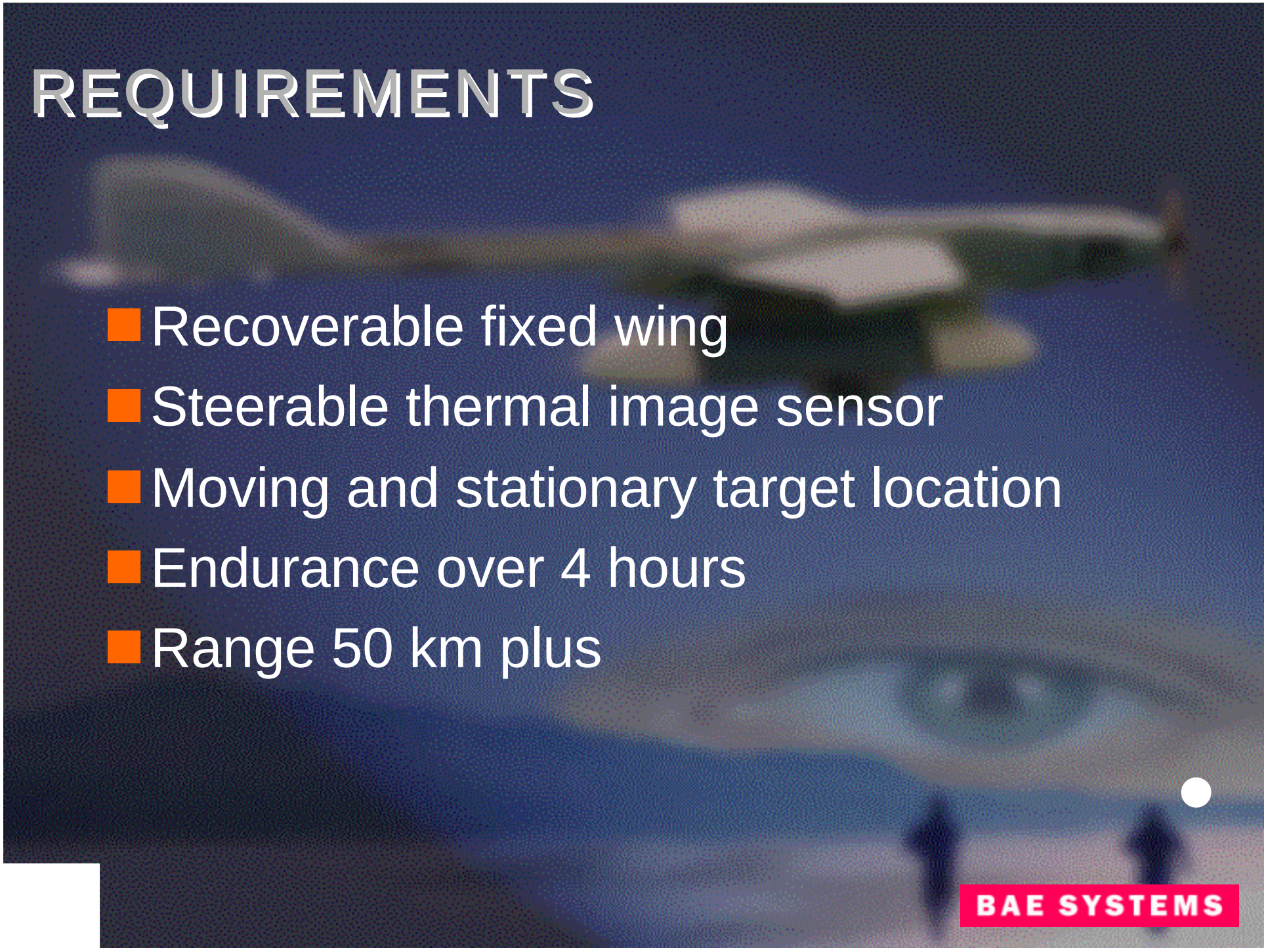
REQUIREMENTS



- Recoverable fixed wing
- Steerable thermal image sensor
- Moving and stationary target location
- Endurance over 4 hours
- Range 50 km plus

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AIR VEHICLE

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PHOENIX LAUNCHED

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PHOENIX LAUNCH SUPPORT VEHICLE

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PHOENIX UNDER RECOVERY

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INSIDE GROUND CONTROL STATION

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GROUND DATA TERMINAL

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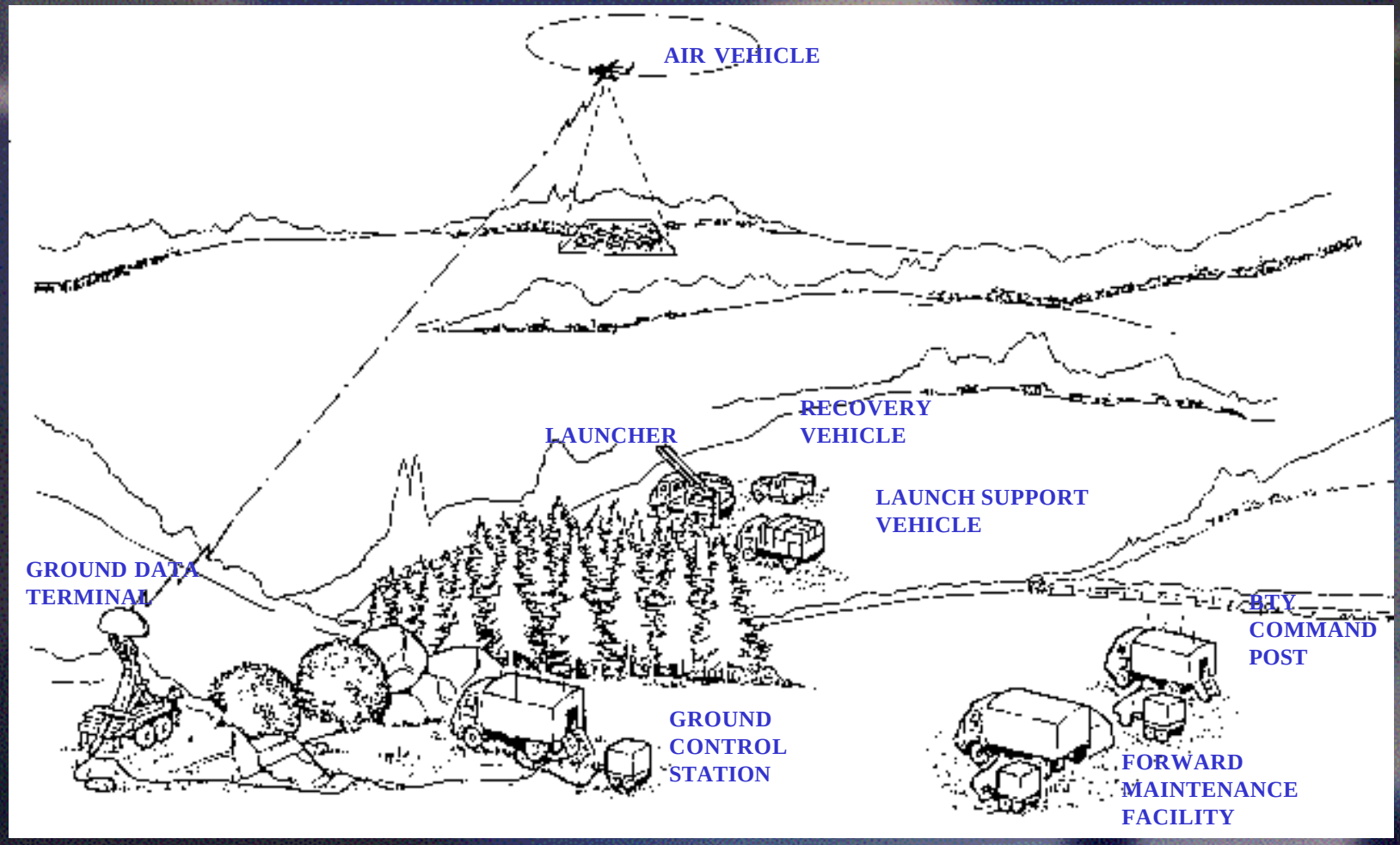
PHOENIX DEPLOYMENT



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CHANGES IN OPERATIONAL REQUIREMENTS

Originally designed to provide surveillance and target acquisition for the Multiple Launch Rocket System and the AS90 SP gun.

The role of Phoenix is now to provide 24 hour medium range target acquisition and battlefield surveillance

Phoenix was extensively used in the role of battlefield surveillance in Kosovo

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KOSOVO FLIGHTS AND LOSSES

- Total Flights 620
- 90% are Operational
- Kosovo 1 - Lost 15 AVT’s and 11 POD’s
- Kosovo 3 - Lost 11 AVT’s and 7 POD's
- Training Lost 6 AVT’s and 5 POD’s
- Forecast % losses are 9.17 for the above total flights. Currently AVT 8.86% POD 6.37%
- Number of flights equivalent to12 years usage
- Total losses to date 67

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TRAINING REQUIREMENT & TRAINING SPLIT

Two main areas

- **User Training**
- **Maintenance Training**

Two Main Cap Badges Involved

- **RA (Royal Artillery)**
- **REME (Royal Electrical & Mechanical Engineers)**

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User Training included

- Air Vehicle Control
- Mission Control
- Image Analysis
- Launcher Operation
- Assembly and Disassembly
- Recovery Procedures
- Power Up/Down Sequences
- Level 1 Maintenance Tasks

User Training to be completed by the RA Training School after a Train the Trainers Course and a period of OJT for the Trainers on the general use of the equipment.

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Maintenance Training included

- Level 1 Maintenance Tasks
- Level 2 Maintenance Tasks
- Limited Level 3 repair at Battery Echelon
- Engineering Support for RA

It was originally intended to use the REME Training School to carry out the Maintenance Training, in fact a one off Train the Trainers course was completed in 1994.

However with the introduction of a CLS Maintenance Policy, it was decided to include Training by Contractors within the contract.

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Maintenance Training

Two main areas of Maintenance Training needed to be covered

- Electrical & Avionics tasks to be carried out by Control Equipment Technicians (CETs)
- Mechanical Tasks to be carried out by Vehicle Mechanics (VMs)

The original Train the Trainers Course in 1994 was designed to cover all the maintenance tasks within the AESPs. The Trainers were then going to carry out their own TNA and design a course

Therefore no specialised Training Equipment was called up at this time. Real Equipment was used.

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When it was decided to use Contractor Training. The Customer Training liaised with REME TDT enabling them to carry out the TNA

However, due to time and commercial constraints, it had been decided to base the Training on the original course using “Real Equipment”.

The TNA therefore concentrated on the Task and Gap Analysis and not on Media selection. The TNA was completed in 1997 covering Electrical and Mechanical courses.

The first courses held in 1998 and one set of courses every year since that date.

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MAINTENANCE TRAINING - What has changed

Very little,

Courses still being carried out on “Real Equipment”

Courses adjusted where possible to inputs from EXVAL supplied by REME TDT. These have been minor up to this time.

A revisit being carried out on the TNA as part of a renewed five year CLS Contract. We will work closely with REME TDT on this again

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LESSONS LEARNED – MAINTENANCE TRAINING

The Main Areas:-

- Equipment availability
- Equipment Usage Priorities
- Potential damage to “Real Equipment” during Training
- Long term Maintenance problems , when using dedicated Real Equipment for Training
- Sensible and realistic Fault Diagnosis capability with real equipment
- Problems of Skill Fade with no dedicated Training Simulation/Emulation equipment

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USER TRAINING

Phoenix User Training is carried out by the RA Training Departments, either in the Regiments or at the RA School - Tasks are of varied skill and experience.

The RA Trainers and Training Development Teams attended a Train the Trainers Course supplied by the Contractors Field Support Teams. This training was also the first steps of Conversion Training

They also worked alongside the Field Teams to gain hands on experience.

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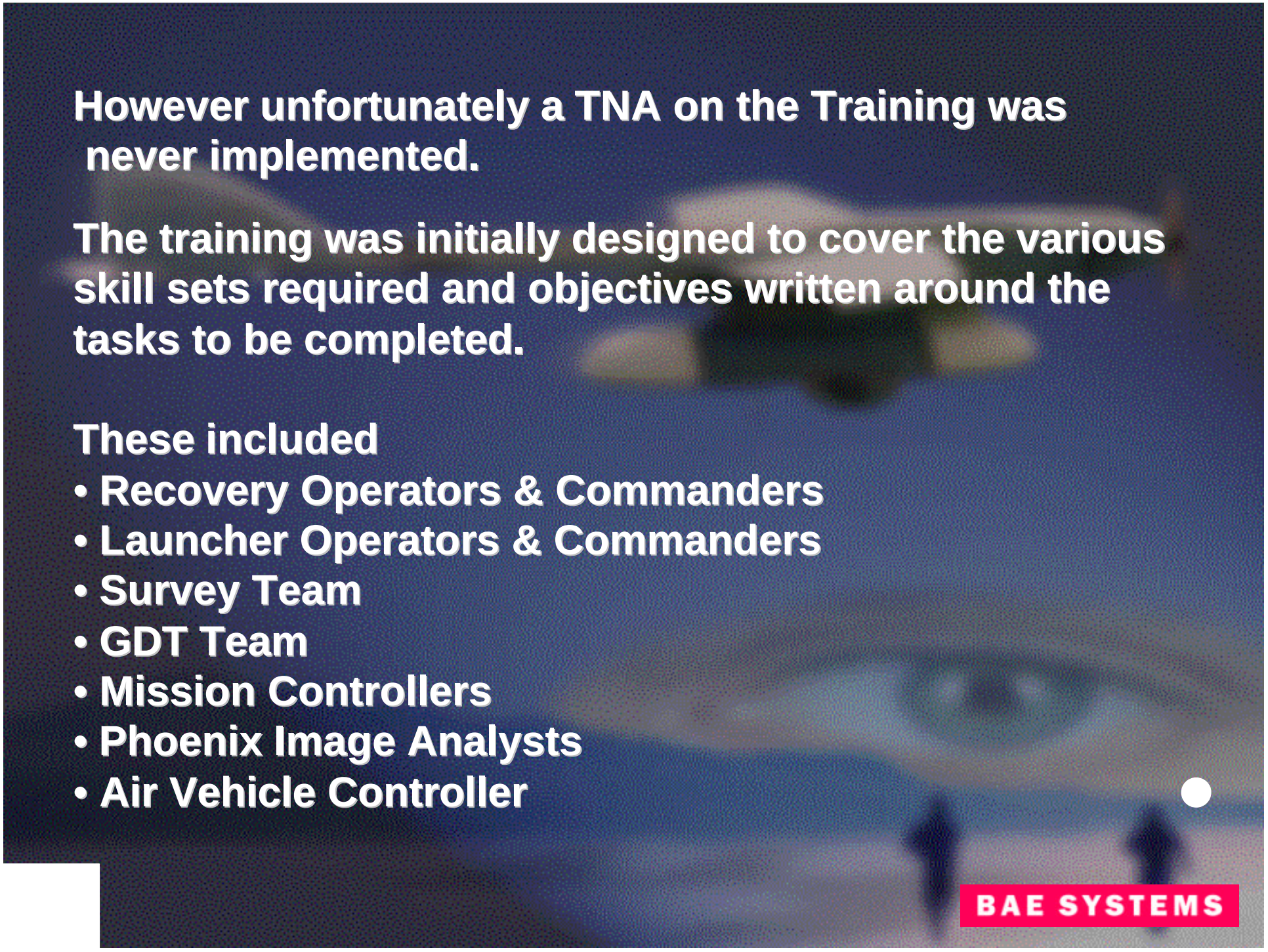
However unfortunately a TNA on the Training was never implemented.
The training was initially designed to cover the various skill sets required and objectives written around the tasks to be completed.
These included
• Recovery Operators & Commanders
• Launcher Operators & Commanders
• Survey Team
• GDT Team
• Mission Controllers
• Phoenix Image Analysts
• Air Vehicle Controller
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As with the Maintenance Training no requirement was placed for any Training Media, except classroom and real equipment.

However a Phoenix Interim Team Trainer (PITT) was developed by BAE SYSTEMS based around a development rig

The PITT was designed to be a low cost Air Vehicle Simulator to be used for GCS crew training purposes until a full Team Trainer became available

It was contained in a 19 inch rack with a VDU, keyboard as well as dedicated Phoenix LRUs and specialised PITT equipment.

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The training of Launch and Recovery personnel is conducted on GFE consisting of the “Real Equipment”

The operator training on the GCS takes place in the confined space of box bodies of the GCS

There was no real time interaction or team training for the Image Analysts.

First User training completed in Canada October 1998

System entered service December 1998

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USER TRAINING - What has changed

Quite a lot

Firstly the way Crewman 2000 has changed the organisation of the Phoenix User Crews.

This provides a platform based multi-skilling training requirement covering effectively four levels of Training

Level 1 - Gunner Command Systems
Drivers, Drop Parties (Driver Training - System Info)
Level 2 - Gunner Phoenix Operator
Operate GDT, Part of Launch & Recovery Team
Level 3 - Gunner Phoenix Operator
Flight Controller or Launch & Recovery
Level 4 - Gunner Phoenix Operator
Launch Recovery Commander or Mission Controller

Phoenix Image Analyst -Completed Level 3 Training -JSPI Trained

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Realisation that Skill Fade was a major problem particularly to the GCS Crew.

Training Required within GCS - PITT too large for that function.

Too late and too expensive to introduce Embedded Training

The Solution was

PETS
(Phoenix Emulation and Training System)

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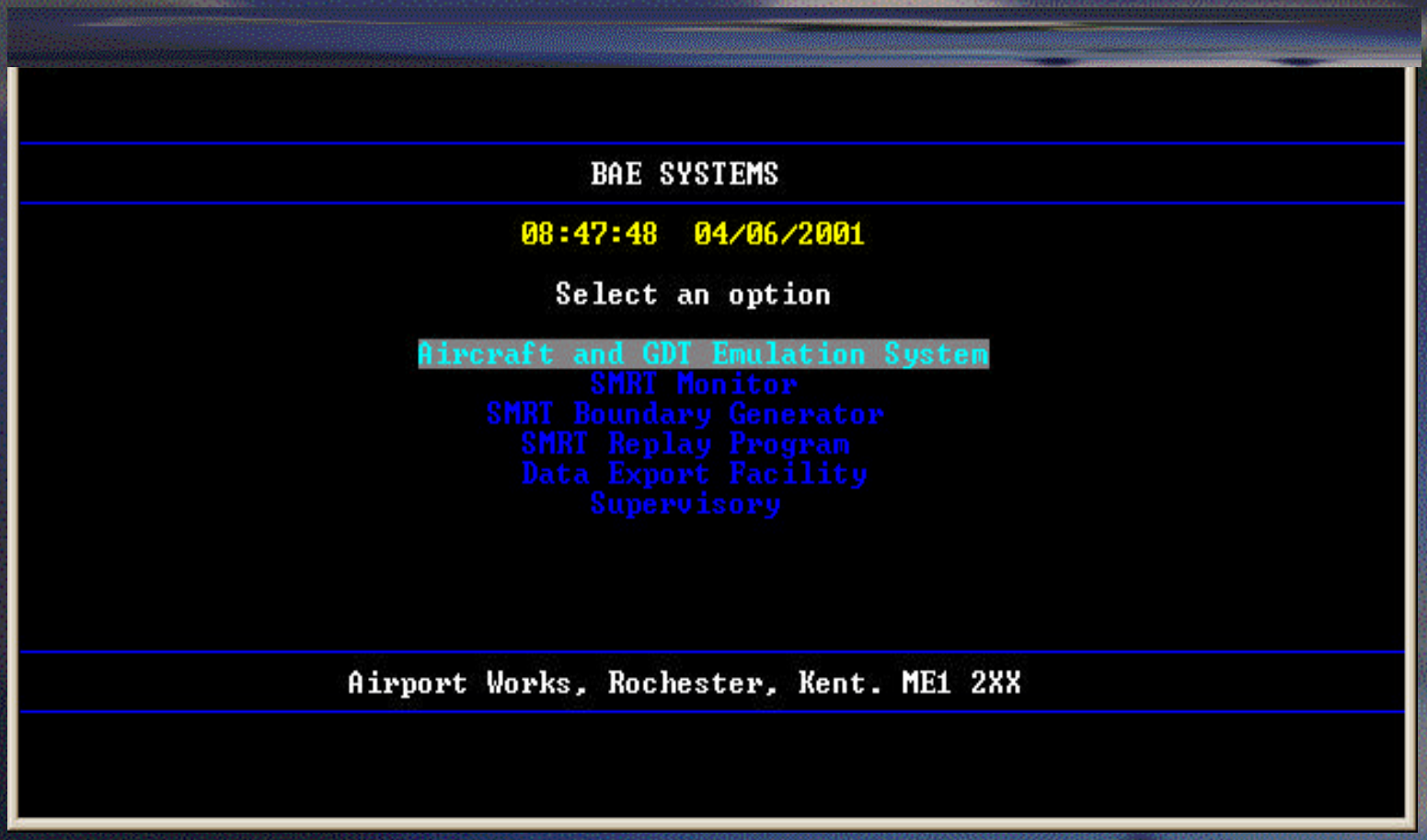
PETS Main Menu



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AGES Simulations

- Taxi
- Pod
- GDT
- Telemetry BIT Codes
- Modelling of Link from LLIU to GDT onwards

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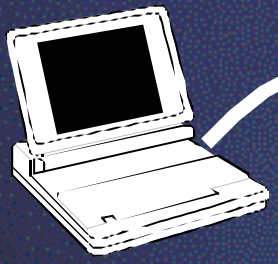
AGES Hardware Connections

AGES Connections - Direct to LLIU



37 way D-Type to VICI Card on lap-top PC

Video Bus Connection to LLIU normally connected to LLTU

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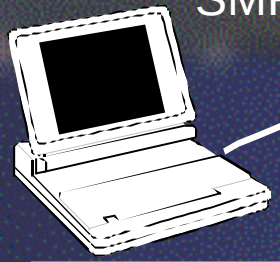
SMRT Hardware Connections

SMRT Connections - Direct to PLAN inside GCS

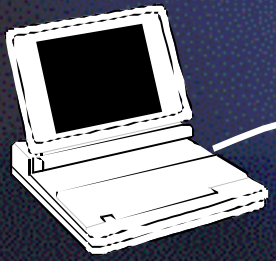


Bus Splitter

To GCS PLAN

To 1553 card on lap-top PC

SMRT Connections - Via Through Skin Connector for monitoring in the Phoenix Safety Vehicle.



GCS Through Skin Connector

Bus Splitter

To GCS PLAN

To 1553 card on lap-top PC

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There is also a Skill Fade problem in the other areas of operation for example the Launch & Recovery areas and in the general areas of assembly.

BAE SYSTEMS as part of its Logistics Function noticed the high rate of reported faults due to handling problems. This was found to reduce drastically as a particular exercise matured.

We developed a demo CBT package that could also be used as Integrated Tech Pubs.

This was completed at company expense on one particular area and sent to the customer for evaluation.

Phoenix Computer Based Training Demo

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LESSONS LEARNED -

The Main Areas:-

- A TNA should have been provisioned.
- Relying on Operational Equipment is not practical
- Classroom Trainers should have been provisioned for GCS Training and maintaining expertise.
- Embedded Training would have been an ideal solution for Skill Fade. Maybe Embedded Training not mature at that time?.
- Assistance for Users involved in the more “Hands On” Training” to overcome Skill Fade. ITPs ?

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It’s a Wonderful Thing - Hindsight

Thank You

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